REMARKS

Claims 1-8 were presented for examination and were pending in this application. In the latest Office Action, claims 1-8 were rejected. On the basis of the following remarks, consideration of this application and allowance of all pending claims are requested.

Claims 1, 3-6, and 8 were rejected as anticipated by U.S. Patent No. 6,667,956 to Beshai et al. Claim 2 was rejected as made obvious by Beshai in view of U.S. Patent No. 6,246,692 to Dai et al. Claim 7 was rejected as made obvious by Beshai in view of U.S. Patent No. 6,631,128 to Lemieux. Applicant respectfully traverses the rejections.

The claims recite a network system comprising a set of nodes, with variable capacity connections transporting data from the source nodes to the destination nodes of the network, wherein the destination nodes of the connections control the capacities of the connections according to the data traffic loads of the connections. Beshai does not disclose (or suggest, in combination with Dai or Lemieux) the claimed network system for a number of reasons, at least some of which are provided below.

"the capacity of each connection [is] controlled from its destination node"

Claim 1 recites that the capacity of each connection configured to transport data from the source node to the destination node is controlled by its destination node. Beshai does not disclose a network system in which the connection capacities are controlled from their destination nodes. For instance, in Beshai, in column, 2 lines 25-34, states that (emphasis added):

> The invention therefore provides a multi-class digital network, comprising: a network control element which periodically receives network traffic and network state information from network nodes, the network control element performing at least the functions of: a) network topology monitoring; and b) computing and distributing network traffic routing sets to network nodes as required;

and in column 2, lines 46-50, that:

> The invention also provides a network control element for a multi-class digital network, comprising: at least one connection with the network adapted to periodically receive network traffic and network state information from node control elements in the network;

further in column 2, lines 57-59, that:

> The multi-class digital network in accordance with the invention distributes the network processing load between a network control element which handles global functions that are best performed at the network level;

as well as in column 2, line 65, to column 3, line 9, that:

> The network control element in accordance with the invention receives traffic intensity and network state information from the nodes in the network which periodically report such information to the network control element. Using the network state information, the network control element maintains a network topology. The network topology and the traffic intensity data are used by the network control element to compute network traffic routing sets which are identified to the nodes along with an order of preference. The computed routing sets are distributed to the network nodes and used by the network nodes in processing traffic admission requests.

It is seen from the above excerpts that the network in Beshai is controlled by a single, global "network control element," shown as the single, central controller element 26 in the network diagram of FIG. 1. This global network control element of Beshai controls, via the routing sets it computes, the processing of traffic admission requests at the network nodes. Thus, per Beshai, a global control element -- instead of the destination nodes -- controls traffic admission to the network. This principle of *global* network traffic routing control in Beshai is in obvious contrast to a network system, as claimed, where the individual *destination* nodes for the connections control their connections' capacities without requiring any global control element.

Moreover, Beshai states in column 7 lines 37-40 that:

> Intermediate nodes 22 in a path are involved in the path allocation process only when the path is first established or when its capacity allocation is modified;

and in column 7 lines 53-57:

> "Each node 22 traversed by a connection is involved in the interrelated decision regarding the admission, or otherwise of the traffic admission request for a connection and the actual selection of the end-to-end route for the request."

further in column 8 lines 28-34:

> "Because a large proportion of connections traverses more than one link 24 in the network 20, the rate allocations for the bands cannot be done independently at each node. The rate allocations must be coordinated amongst the nodes in order to ensure that the physical constraints of the link capacity are observed and that end-to-end service requirements are met."

as well as in column 11 lines 25-30 and lines 49-51:

> "In the shortest path hop-by-hop routing, each node has a list of candidate routes to a destination. The list includes a direct route, if one exists, a set of first-choice routes, and a set of second-choice routes, etc. As described above, the list includes only the next node 22 to a destination along the shortest path. […] The traffic admission request is then forwarded to the next node selected from the routing table."

and in column 13 lines 44-48:

> "In accordance with the method described above for computing EBR, the EBR is dependent on link capacity. It is therefore necessary when setting up a connection through several nodes 22 to compute an EBR at each intermediate node."

These excerpts demonstrate that in Beshai the network path allocation involves the *intermediate nodes*, rate allocations must be coordinated amongst multiple nodes, and routing control requires forwarding of traffic admission requests from node to node. Beshai's network path allocation or routing requiring multi-node processes is in further contrast with the claimed network system, where the capacity of each given network connection is controlled by *its destination node*.

> "based at least in part on the traffic loads associated with the connections"

Claim 1 further recites that the destination node's control of each connection is "based at least in part on the traffic loads associated with the connections configured to transport data to that destination node." Beshai does not disclose this feature.

For instance, in column 1, line 66, to column 2, line 4, Beshai explains:

> It an object of the invention to provide a multi-class digital network which includes a network control element for performing network-wide functions including network topology monitoring and computation and distribution of network traffic routing sets to network nodes in response to changes in network topology.

and in column 6, lines 1-5:

> To ensure that the topological information is accurate and complete, each link 24 is preferably monitored by each of the nodes 22 at its opposite ends. Consequently, if the status of a link 24 changes, the change is reported by two nodes 22 to the network control element 26.

Therefore, per Beshai, network traffic routing is controlled by a network-wide control element, based on changes in network *topology*. This contrasts with the claimed invention, where the connection capacities are controlled by their destination nodes based on the *traffic loads* of the connections.

Furthermore, Beshai states in column 5, lines 16-22:

> Network segregation into bands is preferably done so that each network band corresponds to a traffic class. The same control method applied to a given class should be practised across the network. In order to efficiently use the network, the boundaries between successive bands must be elastic to permit band capacity to expand and shrink in response to variations in network traffic.

and in column 8, lines 16-18:

> The elastic boundaries of a band 36 may vary slowly, typically in seconds, between successive changes.

It is thus seen that the network control in Beshai is based on macroscopic changes in the network topology or in the mix of different type of traffic classes (e.g., voice, video, data) that occur slowly (e.g., at a timescale from several seconds to months or years). This is compared to the realtime variations in, e.g., Internet packet traffic loads, which can alternate between the extremes of network interface capacities in sub-second scale, e.g., at microsecond scale. In addition, Beshai does not disclose specifications for implementing a network system as claimed

where the connection capacities are controlled by the destination node of each connection based on traffic loads associated with each given connection.

"each node . . . providing a connection of variable capacity to the other nodes"

Claim 1 also recites that there are variable capacity connections between each of the nodes in the network system. Beshai does not disclose a network system with variable capacity connections between its nodes.

This is seen, e.g., in Beshai at column 4, lines 42-43:

> The links 24 are designed to support a transfer rate appropriate for the traffic loads that they must transport.

and in column 7, lines 59-60:

> A capacity reservation is necessary to achieve a specified QOS.

And further in column 7, line 67, to column 8, line 2:

> Establishing paths, however, is not the most efficient use of network resources unless adequate stable traffic exists to keep the path full.

as well as in column 8, lines 53-57:

> However, due to the random fluctuations of traffic intensity, a path 32 may occasionally suffer from low utilization. This is particularly the case for low-intensity traffic streams which are normally quite variable in their volume.

As can be seen from the above excerpts, Beshai's network connections do not have variable capacities, as claimed, which would vary automatically according to their traffic load variations. For instance, if Beshai's connections had variable capacities, the network links (which the Office Action equated to the claimed connections) would not need to be "*designed* to support a transfer rate appropriate for the traffic loads that they must transport." It is obvious that the phrase *designed* in case of network connections refers to network planning that took place before the network began carrying traffic. Likewise, because Beshai explains that "capacity reservation is

necessary," the connection capacities in Beshai are not variable. In contrast, with the claimed variable capacity connections, the connection capacities vary automatically per their traffic loads, causing the connections to get capacity whenever they have traffic load, thus eliminating any need to reserve capacity. Furthermore, Beshai explained that its network paths can be efficient only for *stable* traffic, and that traffic streams whose volumes are variable over time cause the utilization of their associated paths to be low. Again, this would not be the case with variable capacity connections as claimed.

Moreover, in addition to the excerpts from Beshai in the foregoing discussing its path and connection establishment processes, Beshai explains, in column 3, line 39-40:

> High bit-rate connection-oriented traffic is preferably served by connections set up on demand;

and in column 9, lines 24-27:

> End-to-end paths 32 are used for direct connections, and are established whenever the end-to-end traffic volumes exceed a certain threshold.

moreover in column 7, lines 49-53:

> A connection 34 seeks admission at a specific ingress point in the network. A connection specifies a destination, but there is no fixed route between the originating node and the destination node of the connection. Rather, a route is negotiated when the connection is set up.

and further in column 13, lines 31-35:

> When a traffic admission request is accepted, the computed EBR is added to the memory register in the sampling frequency circuit 54 of the link service-rate controller 50 (FIG. 11). When a session ends and the connection is torn down.

Beshai's connections thus need to be specifically *set up* or *established* as well as *torn down* from time to time during the network operation, based on, e.g., an increase in traffic volume. The network connections per Beshai thus do not by default exist in the network; if they did, there would be no need to establish or tear down connections due to, e.g., traffic volume fluctuations.

That Beshai's connections need to be specifically set up for traffic streams admitted to the network further indicates that Beshai's connections, besides not existing automatically in the network between the nodes, are not variable bandwidth connections either (even after they are set up).

Therefore, Beshai does not disclose a network system as claimed, wherein each node provides a connection of variable capacity to the other nodes.

For any of the foregoing reasons, Beshai does not anticipate claims 1, 3-6, and 8. Because Beshai was applied in the obviousness rejections of claims 2 and 7 in the same way as applied to claim 1, and so claims 2 and 7 are patentable for the same reasons.

Based on the foregoing, the application is in condition for allowance of all claims, and a Notice of Allowance is respectfully requested. If the examiner believes for any reason direct contact would help advance the prosecution of this case to allowance, the examiner is encouraged to telephone the undersigned at the number given below.

Respectfully submitted,
MARK SANDSTROM

Dated: February 5, 2007

By: /Robert A. Hulse/

Robert A. Hulse, Reg. No. 48,473
Attorney for Applicant
Fenwick & West LLP
801 California Street
Mountain View, CA 94041
Tel.: (415) 875-2444
Fax: (415) 281-1350